Newsletter from
NOWPAP CEARAC

Northwest Pacific Action Plan
Special Monitoring & Coastal Environmental Assessment
Regional Activity Centre

No. 9
January 2013

Greetings from the Director of CEARAC

Since 2002, CEARAC has been working on special monitoring and assessment of the marine environment with harmful algal blooms as one of the target phenomenon, and utilizing remote sensing techniques besides on-site observations and researches.

Recently, CEARAC expanded its scope of focal areas to eutrophication and marine biodiversity. Eutrophication causes serious damage on fisheries in the NOWPAP region, thus is one of our common issues of interest. Biological diversity is recognized as one of the major indicators to assess the state of the marine environment.

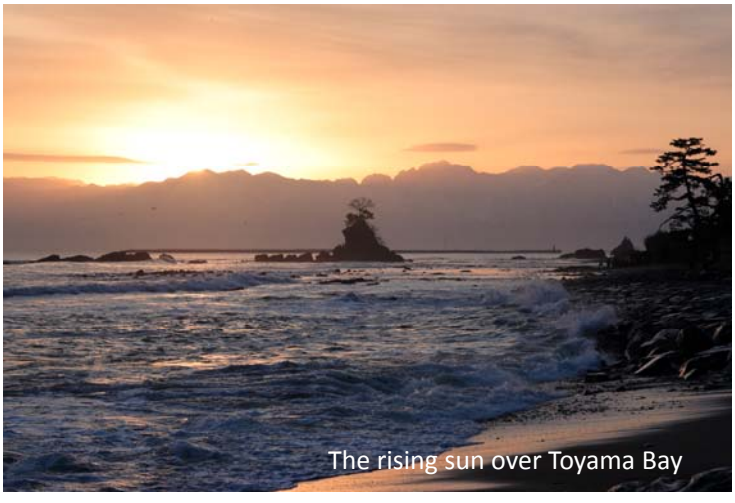
In the last biennium (2010-2011), assessment of the eutrophication status was conducted in the selected sea areas in the NOWPAP region with the Common Procedures developed in 2009.

In addition to the development of new assessment tools, CEARAC puts emphasis on capacity building in the NOWPAP member states. In October 2011, the 3rd training course on remote sensing data analysis was conducted in Vladivostok, Russia. 22 trainees joined the training course from the four NOWPAP member states and the neighboring countries including India, Indonesia, and the Philippines. As this event was jointly organized with PICES and IOC/WESTPAC, CEARAC has been facilitating cooperative work with other NOWPAP RACs and other regional and international organizations seeking synergy effects on conservation of the coastal and marine environments.

In the 2012-2013 biennium, CEARAC plans to implement 3 major activities: refinement of the Common Procedure; preparation of the regional report for conservation of marine biodiversity and sustainable use of marine ecosystem services in the NOWPAP region; and the 4th training course on remote sensing data analysis.

Each activity is in progress on schedule as specified in the workplan adopted in the 16th Intergovernmental Meeting (Dec. 2011). The details are further introduced in the later pages.

I, as the Director of CEARAC, believe that our continued efforts can firmly contribute to the overall goal of NOWPAP, and look forward to your continued support and collaboration.



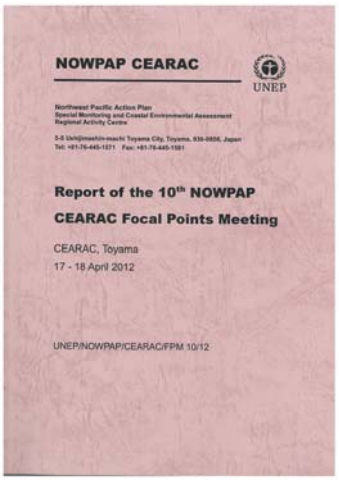
The rising sun over Toyama Bay

Hiroshi Ono, Director of CEARAC

Contents

Greetings ····· 1
10th CEARAC FPM ····· 2
Progress of Current Activities ····· 3
Cooperation with other international and regional organizations ····· 4
Upcoming events of our partners··· 8

The Tenth CEARAC Focal Points Meeting



The Tenth CEARAC Focal Points Meeting was held on the 17th and 18th of April 2012 in Toyama, Japan. 16 experts and authorities including the members of FPM, representatives of NOWPAP RCU and RACs, and others participated in the meeting.

At first, the Director of CEARAC reported the implementation and expenditure of CEARAC activities for the 2010-2011 biennium. One of the major projects in this biennium is assessing the eutrophication status. Using the NOWPAP Common Procedure which CEARAC developed in 2009, the eutrophication status in 5 sea areas (the Changjiang River Estuary and it adjacent area, the Northwest Kyushu area, Toyama Bay, Jinhae Bay and Peter the Great Bay) were assessed and the results were compared. In general, the areas close to the coast are more eutrophicated because of stronger impacts of anthropogenic activities. Each assessment result of the 5 areas is shown in the integrated report of the eutrophication status. Besides this report, two revisions of the integrated reports on harmful algal blooms (HABs) and ocean remote sensing (RS) were also developed.

Next, the workplan and budget for CEARAC activities for the 2012-2013 biennium were explained with the current progress of each activity. Specific projects for the current biennium are on (1) marine biodiversity (2) eutrophication, and (3) ocean remote sensing. CEARAC plans to develop a regional report for conservation of marine biodiversity and sustainable use of marine ecosystem services in the NOWPAP region, so, information of MPAs in each member state is being collected to analyze the monitoring and management status of them. On eutrophication, CEARAC has been improving some assessment parameters in the NOWPAP Common Procedure for another assessment in the existing and new marine areas.

Besides the activities to be implemented under the framework of CEARAC, there is one collaborative work planned to be implemented in the 2012-2013 biennium: development of the second “State of Marine Environmental Report for the NOWPAP Region” (SOMER-2). This activity has been conducted under the leadership of POMRAC and CEARAC and other RACs will take responsibilities for some chapters and/or sub-chapters depending on their expertise and experiences.

Report and Documents of CEARAC FPM10: http://cearac.nowpap.org/fpm/fpm10.html

Photos taken during the 10th CEARAC Focal Points Meeting (17- 18 April 2012, Toyama, Japan)

Progress of the current activities

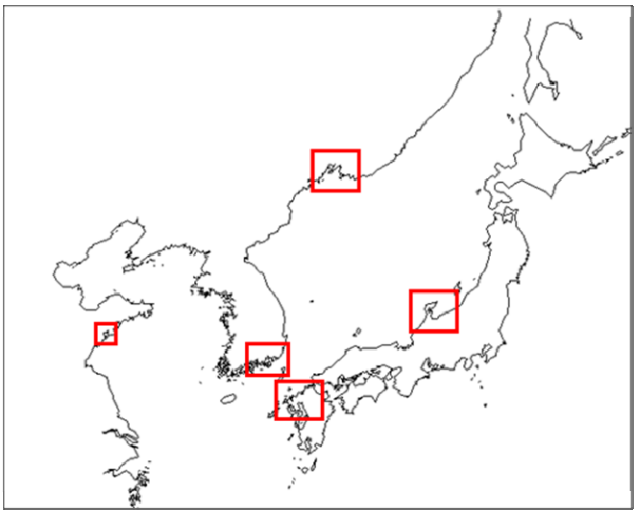
Following the adoption of the 10th FPM, CEARAC has been implementing its planned activities for the 2012-2013 biennium as follows:

(1) Marine biodiversity

Experts of each member state are collecting information on monitoring and management in the selected Marine Protected Areas (MPAs). The results of the research will be presented at the workshop in March 2013 and compiled as the regional report for conservation of marine biodiversity and sustainable use of marine ecosystem services in the NOWPAP region.

(2) Eutrophication

CEARAC prepared a draft of the refined NOWPAP Common Procedure and circulated it to the nominated experts. After their review and addition of more revisions, CEARAC finalized the refined procedure. The experts of each member state will assess the eutrophication status at the selected sea areas with the refined procedure. The results of the assessment will be submitted to CEARAC in 2013.



Selected areas
Jiaozhou Bay, China
Northwest Kyusyu sea area, Japan
Toyama Bay, Japan
Jinhae Bay, Korea
Peter the Great Bay, Russia

(3) Ocean Remote Sensing

The 4th Training Course on Remote Sensing Data Analysis is planned to be organized in fall in 2013 at Ocean University of China in Qingdao, China with help of China National Environmental Monitoring Center. The course consists of lectures and hand-on sessions. More information such as dates, lecturers and application will be uploaded on CEARAC website soon.

(4) Marine Litter

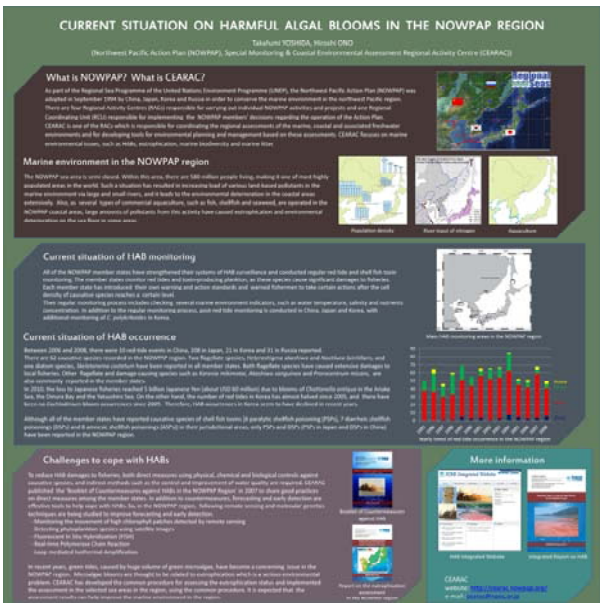
CEARAC has been developing the “regional report on government measures and best practices for prevention of marine litter input from land-based sources in the NOWPAP region” which introduces existing countermeasures in the NOWPAP member states. This can be a good tool for information-sharing and applying more measures against marine litter in the NOWPAP region.

Cooperation with other international and regional organizations

ASLO Aquatic Science Meeting (8-13 July, Shiga, Japan)

A CEARAC staff member made a poster presentation at 2012 ASLO Aquatic Science Meeting and introduced the "Integrated Report on Harmful Algal Blooms for the NOWPAP Region" which CEARAC developed in 2011, as well as distributed CDs of the report to meeting participants.

In the session on "Research Frontiers in Harmful Algal Bloom Prediction, Mitigation and Prevention" (SS44 on July 13th), there were presentations on the Northwest Pacific region such as "Limiting nutrients of the toxic dinoflagellate, *Alexandrium tamarense*, and the non-toxic diatom, *Skeletonema* sp. in Osaka Bay, Japan" and "Sediment perturbation as a prevention strategy for harmful algal blooms in coastal sea: utilization of diatoms through germination of resting stage cells."



For a larger view: PDF http://www.cearac-project.org/cearac-project/newsletter/09_00.pdf)

NOWPAP ICC/WS & International Ecological Forum "Nature without Borders" (17-20 July, Vladivostok, Russia)

NOWPAP International Coastal Clean Up Campaign was organized on July 17th at the Emar Bay this year, and representatives from the NOWPAP member states and the Russian students who were staying at All-Russia Child Center "Ocean" joined the beach cleaning activity.

On the 18th, a workshop on marine litter was held and a CEARAC staff member introduced a new report on best practices for prevention of marine litter input from land-based sources in the NOWPAP member states, which is developed in 2012. (PDF http://www.cearac-project.org/cearac-project/newsletter/09_01.pdf)

The International Ecological Forum "Nature without Borders" was held on the 19th, and the CEARAC staff member also gave a presentation and introduced current activities of NPEC, which is a host organization of CEARAC, on countermeasures against transboundary marine litter.

(PDF http://www.cearac-project.org/cearac-project/newsletter/09_02.pdf)

PICES 2012 Annual Meeting (12-21 October, Hiroshima, Japan)

As a representative of NOWPAP, CEARAC has participated in the Section Ecology of Harmful Algal Blooms in the North Pacific on meeting as an ex-officio member of PICES. For HABs-related issues, there was a session on "Range extension, toxicity and phylogeny of epiphytic dinoflagellates" in the 2012 annual meeting. In recent years, there has been Cigatera Fish Poisoning by epiphytic dinoflagellates (*Gambierdiscus*) around the world and this problem has affected human health. The current status of the problem in the PICES member states and the ecological features of the causative species were reported in the session. There also was a workshop focusing on "the contrasting cases of HABs eastern and western Pacific in 2007 and 2011," and the environmental conditions and the status of HABs on each coast of the respective years were introduced.

As for CEARAC, its focal areas have been expanded from HABs in recent years and it has been developing a new marine environment assessment tool for conservation of marine biodiversity since 2009. Taking into consideration synergy effects of cooperation and coordination with other international organizations, CEARAC has contacted relevant organizations and exchanged information on selection of standard indicators for the new assessment tool. Since WG28 of PICES (WG on Development of Ecosystem Indicators to Characterize Ecosystem Response to Multiple Stressors) has been developing "Ecosystem Indicator", CEARAC has participated in the WG meeting and paid more attention to the progress of other organizations' relevant activities. In the 2013 annual meeting, a workshop on economic impacts of harmful algal blooms on fisheries and aquaculture will be organized.

Regional Workshop on Marine Invasive Species Problems in Northwest Pacific Region (23-24 October, Qingdao, China)

A CEARAC staff member attended the regional workshop on marine invasive species (MIS) problems by DINRAC and gave two presentations in the workshop and introduced (1) Basic Surveys for International Convention for the control and management of Ships' Ballast Water and Sediments, as a national activity of Japan on Invasive species, and (2) the Regional Report for conservation of marine biodiversity and sustainable use of marine ecosystem services in the NOWPAP region, which is under development by CEARAC (PDF http://www.cearac-project.org/cearac-project/newsletter/09_03.pdf).

The participants expressed their concern on serious situations of the problem in the region, and it was recognized that more frequent and detailed information exchange and cooperation and coordination with relevant organizations and actors are necessary.

15th International Conference on Harmful Algae (29 October - 2 November, Changwon, Korea)

There were about 500 experts on HABs participated in the conference, and CEARAC set a booth for displaying posters on NOWPAP and CEARAC. CDs for the current CEARAC reports (Booklet of Countermeasures against Harmful Algal Blooms in the NOWPAP region, three Integrated Reports on HAB, RS and Eutrophication) were also distributed to participants.

With a CEARAC staff member, graduate students from the University of Tokyo Ocean Alliance participated in the conference as a part of Internship program and had great opportunities to communicate with the participants from all over the world.

2nd International Symposium on Expertise in Sustainable Society (29-30 November, Toyama, Japan)

2nd International Symposium on Expertise in Sustainable Society was organized by Toyama National College of Technology on 29-30 November 2012 in Toyama, Japan. The aim of this workshop is to discuss expertise in economics and environment to build sustainable society collaborating with the world wide links. Experts and scientists from China, Korea, Malaysia, UK and USA participated in the symposium and presented their latest research findings in the following respected sessions.

- Waste management
- Disaster prevention and environmental monitoring in Toyama Bay Area
- Technologies for Actions towards Restoration after the Fukushima Daiichi Nuclear Disaster
- Functional materials

Genki Terauchi, a senior researcher of NOWPAP CEARAC, introduced CEARAC's activities on remote sensing of the marine environment in the Northwest Pacific including satellite based eutrophication assessment in Toyama Bay and detection of seagrass damages in the Pacific coast of Tohoku by the tsunami on 11 March 2011.

It was a good opportunity to advertise NOWPAP to the international audience.

The status of damage on the seagrass beds by the 2011 tsunami along the coast of Miyagi Prefecture

The Tohoku Coast (the northeast side of the main land of Japan) had devastated damage by the tsunami occurred after the Great East Japan Earthquake on 11 March 2011.

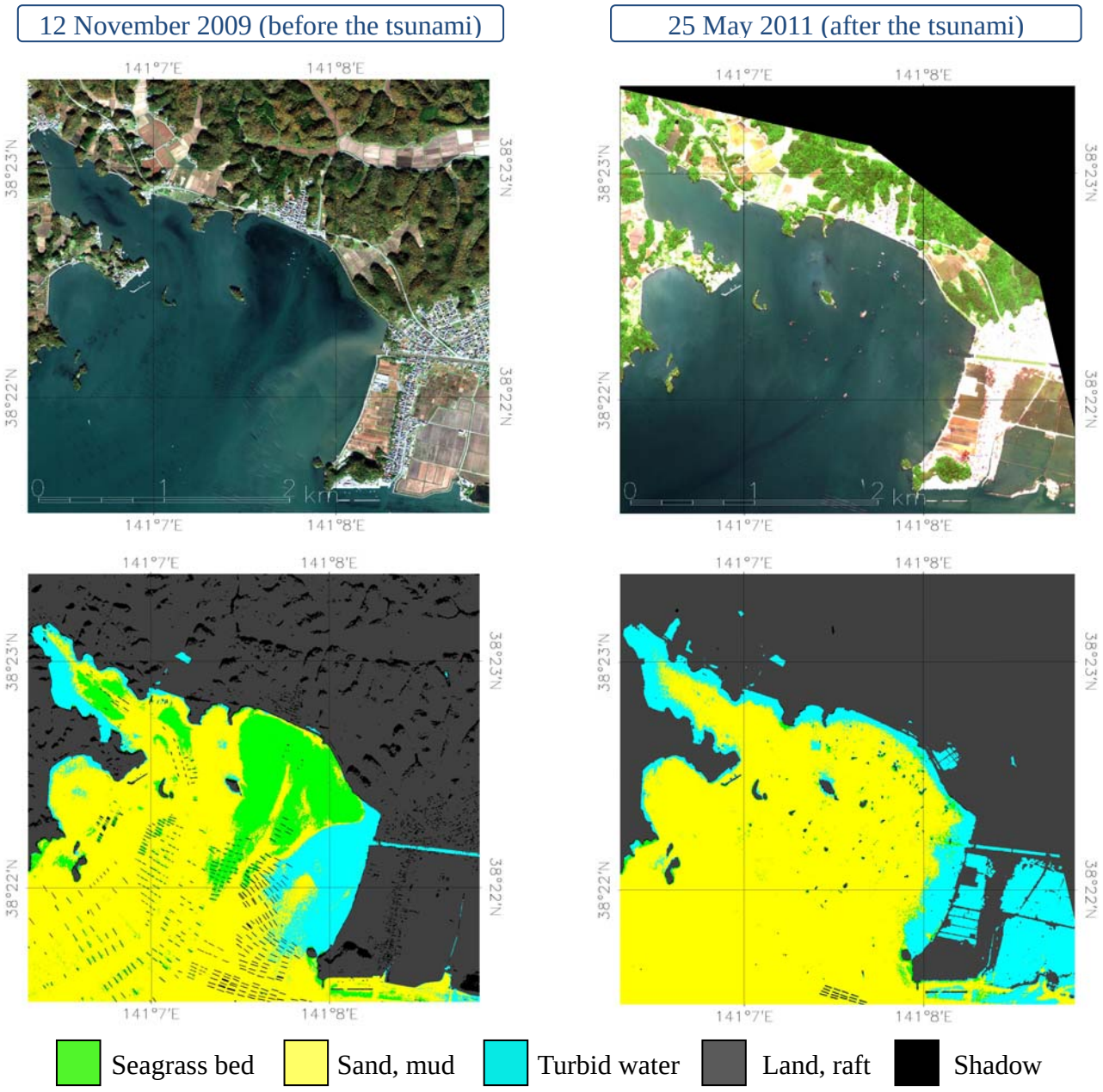
More than a year has passed since this disaster; however, the accurate status of the damage on seagrass beds and the process of their recovery are not been assessed.

The Northwest Pacific Region Environmental Cooperation Center (NPEC) and the Atmosphere and Ocean Research Institute, the University of Tokyo have been conducting the research project to assess the damage and process of recovery on the seagrass beds in the four areas in Miyagi Prefecture (Shizugawa Bay, Sendai Bay, Mangokuura Bay, and Matsushima Bay) since 2011. Large-scale changes on the seagrass beds are being revealed by the analysis of the remote sensing images taken before and after the earthquake.

Satellite image analysis in Matsushima Bay

The total area of the seagrass beds in Matsushima Bay was 363 hectares* before the tsunami; however, it was reduced to 99 hectares after the tsunami. Thus it is estimated that 264 hectares of the seagrass beds were lost, which is equivalent to the area as big as 56 Tokyo Domes (a baseball stadium in Tokyo). There used be dense distribution of eelgrasses in most of the damaged areas. Aquaculture rafts for oyster and Nori seaweed cultivation were also swept away, reduced from 3,248 to 163. In Higashimatsushima City, some land areas were inundated. These results were provided to the organizations and researchers who conduct recovery programs of seagrass beds.

* 1 hectare is 10,000 square meters.



In-situ observation in Shizugawa Bay

Because of a ria coast, the destructive power of tsunami concentrated to the innermost part of the Shizugawa Bay and caused serious damages to eelgrasses. Few eelgrass communities in some sea areas have been observed after the disaster. On the other hand, the extent of the damage on *Sargassum* sp. (*Hondawara*) and *Eisenia bicyclis* (*arame*) on rocky substrate was relatively small, and their communities remained in the sea after the tsunami. Dense distribution of *Saccharina japonica (makombu)* and *Undaria pinnatifida (wakame)* have been observed after the disaster.

Upcoming events of our partners

PICES Summer School on "Ocean observing systems and ecosystem monitoring"

Dates: August 19-23, 2013
Location: Newport, OR, USA
Application Deadline: **March 15, 2013**

This 2013 PICES summer school offers up to 40 students an opportunity for an introduction to hi-tech ocean observing. The week-long school will feature a mix of classroom lectures, laboratory demonstrations of inter-disciplinary ocean sensors, an introduction to ocean observing platforms(moorings, coastal stations, sea-floor landers, autonomous underwater vehicles), and field work on a research vessel to deploy ocean observing equipment at sea. The school will cover a range of sensors and sampling equipment used to measure physical, biological and chemical properties of the ocean. The utility of time-series datasets generated by moored monitoring stations to estimate net ecosystem metabolism for estuarine and coastal habitats will also be demonstrated. More information about applying can be found on the PICES website at http://www.pices.int/meetings/summer_schools/2013_summer_school/2013-Newport-ss/2013-Newport-ss-main.aspx

NOWPAP CEARAC
Northwest Pacific Action Plan
Special Monitoring & Coastal Environmental Assessment Regional Activity Centre
Established at NPEC (Northwest Pacific Region Environmental Cooperation Center)
5-5 Ushijimashin-machi, Toyama City, Toyama 930-0856, JAPAN
Tel: +81-76-445-1571 / Fax: +81-76-445-1581
Website: http://cearac.nowpap.org/ Email: webmaster@cearac.nowpap.org